

What is claimed is:

1. An adapter for an implantable cardiac lead comprising:
 - a housing with an interior axial opening and an outer surface, the interior axial opening configured to receive a mating terminal end of the implantable cardiac lead;
 - a plurality of inner contacts within the interior axial opening and a plurality of outer contacts on the outer surface, each of the inner contacts electrically connected to an outer contact;
 - the inner contacts configured to electrically link with contacts on the mating terminal end of the implantable cardiac lead when the mating terminal end of the implantable cardiac lead is positioned within the interior opening;
 - the axial opening including a mechanical retention means to releasably hold the housing to the terminal end; and
 - the outer surface configured for physical and electrical connection of the outer contacts to a testing cable in communication with a device for testing electrical aspects of the cardiac lead.
2. The adapter of claim 1, wherein the adapter is releasably mounted to the testing cable for testing the electrical continuity of the cardiac lead.
3. The adapter of claim 2, wherein each of the outer contacts of the adapter are connected to the testing cable by an alligator clip on the cable.
4. The adapter of claim 1, wherein the terminal end of the implantable cardiac lead includes four contacts, the housing includes two inner contacts and two outer contacts, and insertion of the terminal end of the implantable cardiac lead within the interior opening of the housing electrically links two of the contacts of the terminal end with the two inner contacts and the two outer contacts of the adapter.
5. The adapter of claim 1, wherein the terminal end of the implantable cardiac lead includes two contacts, the housing includes two inner contacts and two outer contacts,

and insertion of the terminal end of the implantable cardiac lead within the interior opening of the housing electrically links the two contacts of the terminal end with the two inner contacts and the two outer contacts of the adapter.

6. The adapter of claim 1, wherein the housing includes a first end through which the terminal end of the implantable cardiac lead is inserted within the interior opening and a closed second end, and further includes an opening adjacent the second end to permit air to escape the axial opening as the terminal end is inserted within the axial opening.

7. The adapter of claim 6, wherein outer surface of the housing includes a plurality of recesses with the outer contacts each positioned at a bottom of one of the recesses.

8. The adapter of claim 7, wherein the testing cable is connected to the outer contacts in the recesses of the outer surface by spring clips.

9. The adapter of claim 7, wherein a pair of outer contacts is electrically connected to each inner contact and each pair of outer contacts are positioned opposing each other on the outer surface of the housing within opposing recesses.

10. The adapter of claim 6, wherein the outer housing about the interior axial opening defines a first portion, the closed second end includes an axial extension which is smaller in diameter than the first portion, and the outer contacts are positioned on the axial extension.

11. The adapter of claim 10, wherein the axial extension is approximately the same diameter as the terminal end of the implanted cardiac lead.

12. The adapter of claim 6, wherein the housing includes a first half and second half, the halves hingedly connected to one another by an axially arranged hinge adjacent the outer surface of the housing, the halves movable between an open position and a closed

position, and each half includes a interior recess, the interior recesses cooperating to form the interior axial opening when the halves are in the closed position.

13. The adapter of claim 12, wherein the outer contacts are tabs extending from the outer surface of the housing.

14. The adapter of claim 13, wherein the inner contacts are positioned within the interior recess of the first half of the housing.

15. The adapter of claim 14, wherein a second set of inner contacts are positioned within the recess of the second half of the housing and each inner contact in the recess of the first half is paired with one of the second inner contacts in the recess of the second half and each of the pairs of inner contacts and second inner contacts is electrically connected to one of the tabs of the outer contacts.

16. An assembly for testing an implanted cardiac lead comprising:

the cardiac lead including a distal end in electrical communication with a patient's heart and a proximal end including a terminal end adapted for connection to a pulse generating device, the terminal end including a plurality of contacts;

a testing cable adapted to communicate with a device for testing the electrical continuity of the cardiac lead, the testing cable having a distal end including a plurality of spring clips for linking to the terminal end of the implanted cardiac lead and a proximal end for connection to the testing device;

an adapter configured to fit about the terminal end of the implanted cardiac lead and provide electrical connection between the plurality of contacts of the terminal end and the plurality of spring clips mounted at the distal end of the testing cable; and,

the adapter positioned about the terminal end of the cardiac lead and providing an electrical connection between the spring clips of the testing cable attached to a plurality of outer contacts on the adapter and a plurality of contacts on the terminal end of the cardiac lead within the opening.

17. The assembly of claim 16, wherein the number of contacts of the terminal end of the implanted cardiac lead is greater than the number of spring clips of the testing cable.

18. The assembly of claim 16, wherein the adapter includes a housing defining an axial opening with a first end through which the terminal end of the implanted cardiac lead is received and a second closed end with an opening adjacent the second closed end to permit air to escape from the axial opening when the terminal end is inserted within the axial opening, the axial opening further includes a plurality of inner contacts for electrically linking to contacts of the terminal end, and the housing further includes an outer surface on which a plurality of outer contacts are positioned, each the inner contacts electrically connected to one of the outer contacts and the spring clips of the testing cable connected to the outer contacts.

19. The assembly of claim 18, wherein the outer contacts are positioned within recesses in the outer surface of the housing.

20. The assembly of claim 18, wherein the outer contacts include tabs extending from the outer surface of the housing.

21. The assembly of claim 18, wherein the housing includes a first portion about the axial opening and an extended portion adjacent the closed end which is smaller in diameter than the first portion, and the outer contacts are positioned on the outer surface of the housing on the extended portion.

22. The assembly of claim 18, wherein the housing of the adapter includes a pair of halves, the halves hingedly mounted to each other by a hinge and movable between an open position and a closed position, each half including a recess and the recesses cooperating to form the axial opening when in the closed position.

23. A cable assembly for connecting an implantable cardiac lead to a testing device, the cable assembly comprising:

an adapter for an implantable cardiac lead including a housing with an interior axial opening and an outer surface, the interior axial opening configured to receive a mating terminal end of the implantable cardiac lead, and a plurality of inner contacts within the interior axial opening, each inner contact configured to electrically link with one of a plurality of a contacts of the mating terminal end of the implantable cardiac lead when the mating terminal end of the implantable cardiac lead is positioned within the interior opening, the axial opening including a mechanical retention means to releasably hold the housing to the terminal end; and

a cable including a distal end to which the adapter is mounted, a proximal end for engaging the testing device, and a plurality of electrical conductors extending from the distal end to the proximal end, each of the inner contacts of the adapter electrically connecting one of the contacts of the mating terminal end with one of the conductors of the cable when the mating terminal end is inserted within the axial opening.

24. The cable assembly of claim 23, wherein the housing includes a first half and second half, the halves hingedly connected to one another by an axially arranged hinge adjacent the outer surface of the housing, the halves movable between an open position and a closed position, and each half includes a interior recess, the interior recesses cooperating to form the interior axial opening when the halves are in the closed position.

25. A method of connecting an implanted cardiac lead to a testing device comprising:

providing the implanted cardiac lead with a distal end positioned within a body of a patient and including a terminal end including a plurality of contacts;

providing a testing cable with a proximal end adapted for connection with the testing device and a distal end including a plurality of spring clips;

providing an adapter including a housing defining an axial opening with a first end and a closed second end, a plurality of inner contacts within the opening and a

plurality of outer contacts electrically connected with the inner contacts on an outer surface of the housing;

placing the terminal end of the cardiac lead within the axial opening of the adapter so that contacts of the terminal end are electrically linked with the inner contacts; and,

connecting the spring clips of the distal end of the testing cable with the outer contacts of the adapter, so that the contacts of the terminal end are electrically connected to the spring clips of the testing cable.

26. A clip for attaching to the terminal end of a multiple conductor cardiac lead, the clip comprising:

a body having a front end and a rear end, and including an upper leg extending from the front end to the rear end, a lower leg extending from the front end to the rear end, the upper and lower legs spaced apart and a web extending between the upper and lower legs intermediate from the front and rear ends;

a plurality of clip contacts extending from adjacent the front end to the beyond the rear end, each contact defining a tab adjacent the rear end;

a first clip contact defining an opening between the upper and lower legs adjacent the front end configured to engage and electrically connect a pin contact of the terminal end of the cardiac lead with the tab of the first clip contact;

a second contact defining an opening between the upper and lower leads adjacent the front end configured to engage and electrically connect a ring contact of the terminal end of the cardiac lead with the tab of the second clip contact.